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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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One of a series

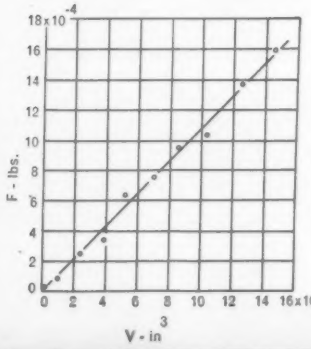
On the riddle of rolling friction

It doesn't take much to roll a hard ball across a hard, smooth, level surface – actually only about 0.00001 times the normal force acting vertically on the ball. But by careful measurement of this tiny rolling force, scientists at the General Motors Research Laboratories are helping to unravel the riddle of rolling friction.

An important relationship recently uncovered in this fundamental study: the rolling force is proportional to the volume of material that is stressed above a certain level. As a result, a GM Research group have not only confirmed the hypothesis of *how* a rolling ball loses energy (Answer: elastic hysteresis) but also have learned *where* this lost energy is dissipated (Answer: in the interior of the material, not on the surface). Mathematical analyses have indicated the exact shape of the elastically stressed volume in which all the significant frictional loss takes place.

The purpose of friction research at the GM Research Laboratories is to learn more about the elastic and inelastic behavior of materials. This knowledge – of academic interest now – will eventually give GM engineers greater control of energy lost through friction. This is but one more example of how General Motors lives up to its promise of "More and better things for more people."

General Motors Research Laboratories
Warren, Michigan



Relationship of rolling force to elastically stressed volume.

MEDICINE

New Blood Paths to Heart

Small doses of radiation directed at the heart appear to be providing new "pipes" through which fresh supplies of blood may reach the heart muscle.

SMALL DOSES of radiation directed to the heart appear to be capable of providing that important muscle with new blood supplies even after the normal pathway of blood to the heart becomes clogged.

This forward step in heart research was developed by Dr. Ivan D. Baronofsky of Mount Sinai Hospital, New York, and Dr. Elliot Senderoff, Research Fellow of the New York Heart Association. They found that radiation directed at dogs' hearts enlarged their capillaries and pre-capillary arterioles (tiny blood vessels). They found that this treatment also increased the number of capillaries, which, in turn, provided additional lines of supply to the heart.

The circulation in the hearts of the dogs was not only improved by the irradiation, but continued to show improvement after treatment stopped, the researchers reported. Extensive studies of the hearts of the dogs revealed that there was an "amazing" increase in the entire circulatory system of the irradiated hearts. In addition, they found no evidence of harmful effects.

This treatment has now been applied to humans, Dr. Baronofsky reported. The work is still in the experimental stage, however, he emphasized. The first patients have been followed only for one year. Results indicate, however, that no harm has been done, the method has not subjected the patients to additional stress and progress so far is encouraging.

Surgical procedures now employed to increase the blood supply to the heart include "poudrage"—introduction of such irritating foreign substances as talc—grafting tissue from other areas, and joining other blood vessels to the coronary system.

Providing the heart muscle with a new supply of blood is the greatest single problem facing cardiologists today. Surgeons want a simple method of achieving this supply, because those who most need help should not be subjected to any more stress than they experience from the shortage due to the clogged arteries.

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GEOPHYSICS

High-Altitude Bomb Tests Cut Radio Reception

THE TWO HYDROGEN bombs exploded 25 to 100 miles high over the Pacific Ocean in August of 1958 are now reported to have significantly cut down radio reception on the Hawaiian Island of Kauai.

This radio listening post, operated by the Boulder (Colo.) Laboratories of the National Bureau of Standards, is situated about 700 miles northeast of Johnston Island over which the H-bombs were exploded on Aug. 1 and 12.

The discovery was made by scientists monitoring radio noise. The observed drop in this noise on certain frequencies following the H-bomb blasts means that regular radio messages on these frequencies would have a harder time getting through to the island. It tends to support speculation that high H-bomb bursts could be used strategically to disrupt radio communications temporarily.

It is believed that a highly ionized region was formed high above the earth when the H-bombs exploded, and that this ionized region lasted several days after each test and greatly increased the ionospheric absorption of certain radio waves. Normally, the ionosphere would not absorb as many radio waves and would reflect more to earth.

Recordings were made of the atmospheric radio noise received on the island for a period before and after the first explosion on Aug. 1. The pre-blast pattern showed that highest noise levels were recorded at night. Normally they fell off rapidly between 4:00 and 8:00 am.

In the hour after the blast, which occurred about midnight, the received radio noise dropped sharply at a time when it should have been rising or holding steady. On the frequencies of 13 kilocycles and five megacycles, recovery of near normal reception occurred in a matter of hours. But from 51 kilocycles through 2.5 megacycles, the disturbance continued to last until the second H-bomb was exploded on Aug. 12. It took until Sept. 1 for reception on some radio frequencies to return to the normal pattern.

These H-bomb tests also have been reported as causing a bright artificial aurora seen at Apia Observatory in the New Hebrides Islands, and temporarily changing the earth's magnetic field.

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OXYGEN FROM THE ROOM—This transportable oxygen unit draws air from the atmosphere, filters out contaminants, extracts oxygen and furnishes this gas to the patient. Developed by Aerojet-General Corporation's Chemical Division, Azusa, Calif., it is expected to be widely used in hospitals and ambulances.

BIOLOGY

Rabbits Used in New Corn Rust Tests

RABBITS have now been given the assignment of helping scientists identify strains of corn rust. University of Wisconsin researchers David Beno and Arthur Flangas said that in the new process a rabbit is injected with a strain of rust (fungus). The rabbit produces antibodies against the infection, and blood serum is then drawn and stored by type, as in a blood bank.

When corn rust is found in a field, a sample of the fungus on the plants and some of the serum are used to determine, according to the reaction of the antibodies, what strain of rust is present. The two researchers said the rabbit's role is to speed the rust identification. With the new test, this requires only two days, compared with two weeks or longer with growing plant tests.

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ENGINEERING

Modern Roads are Threat

MANY ROADS and highways traveled today by drivers of fashionable low-slung cars pose a safety threat in the form of reduced visibility.

Today the average driver's eyes are less than four feet above the pavement, Clyde E. Lee, assistant professor of civil engineering at the University of Texas, told the Highway Research Board meeting in Washington, D. C.

But many well-traveled roads have been designed by highway experts using the 4.5 feet previously recommended as the average height of the driver's eyes above the pavement.

The threat to motorist safety can be corrected through minor changes in road design if the designer recognizes that drivers' eyes are not as high as they used to be, Mr. Lee said.

K. A. Stonex, assistant director of General Motors Proving Grounds, Milford, Mich., suggested guard rails be eliminated where possible to improve new highway safety.

He also suggested the side slopes be gentle, smooth and clear of obstacles, and be built of firm material.

To cut down chances for bad skids, fine bituminous mixtures can be given a sand additive. Profs. Jack E. Stephens of the University of Connecticut and William H. Goetz of Purdue University reported that mixtures made with sand having rounded particles gave the best overall anti-skid performances. Mixtures made with sand having particles with sharp points at first gave higher skid resistance, but these sharp edges soon wore off.

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GENERAL SCIENCE

Reference Citations In Science News Letter

MOST OF THE material in the articles in the SCIENCE NEWS LETTER is obtained by interview in person or by telephone, orally at meetings, and from other unpublished sources. This gives our readers access to new knowledge long before it appears in the conventional journals of original publication. But some of the articles are based on journals of original publication, whose editors most happily often cooperate with SCIENCE SERVICE by making available page proofs or early copies so that their articles are available for prompt reporting in the many newspapers served by SCIENCE SERVICE and in the SCIENCE NEWS LETTER.

Realizing that access to these original publications is important to our readers, SCIENCE NEWS LETTER has long given a citation to the original publication. Now we are adopting the most logically accepted form of such citation. Literature citations appear in many forms. We shall use the name of the journal, abbreviated if the abbreviation is readily understood, followed by the volume number, followed by a colon, followed by the number of the first page on which the article appears (and the inclusive page number where it is available), followed by the year date. Roman, not italics, is used for simplicity. An article in this issue is cited as: Canadian Medical Association Journal, 82:315, 1960, as appears on page 121.

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GENERAL SCIENCE

New Schools Win in STS

EIGHTEEN high schools scattered across the country have joined the distinguished ranks of those that have produced top winners in the Science Talent Search.

First-time schools placing winners in the 19th Science Talent Search are: Hall High School, Little Rock, Ark.; Helix High School, La Mesa, Calif.; Stamford, Conn., High School; Coral Gables, Fla., High School; Gainesville, Fla., High School; Marywood School, Evanston, Ill.; Winchester, Mass., High School; St. James, Minn., High School; St. Louis Park, Minn., High School; Carthage, Mo., High School; A. L. Johnson Regional High School, Clark, N. J.; Lawrenceville, N. J., School; Patchogue, N. Y., Senior High School; Martin Van Buren High School, Queens Village, N. Y.; Kenmore East Senior High School, Tonawanda, N. Y.; Chapel Hill, N. C., High School; Central Catholic High School, Allentown, Pa.; Spring Branch Senior High School, Houston, Tex.

Among the schools producing winners this year, the leader in total winners during the 19 years of the Science Talent Search for the Westinghouse Science Scholarships and Awards is Bronx High School of Science, New York, with 22 top winners. Another New York school, Stuyvesant High School, is second with 20 winners.

Evanston Township High School, Evanston, Ill., and Erasmus Hall High School, Brooklyn, N. Y., are tied with totals of 14.

Midwood High School, Brooklyn, N. Y., now has placed 13. Six consecutive winners are credited to Columbus High School of Marshfield, Wis. Over the years, North Phoenix High School, Phoenix, Ariz., and Newton High School, Newtonville, Mass., have produced six winners each.

Tied with five each are Princeton, N. J., High School and University High School, Bloomington, Ind., followed closely by another tie between Tucson, Ariz., High School and Woodrow Wilson High School, Washington, D. C., which have had four winners each.

Benjamin Bosse High School of Evansville, Ind.; Classen High School, Oklahoma City, and Stonewall Jackson High School, Charleston, W. Va., each have three winners now. Two winners each have come from Fairfax High School, Los Angeles; East Senior High School, Rockford, Ill.; Technical High School, Springfield, Mass.; Croton-Harmon High School, Croton-on-Hudson, N. Y.; Newport News, Va., High School; and St. Mary High School, Cheyenne, Wyo.

See SNL, 77; 86, Feb. 6, 1960.

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EDUCATION

Need Brains for Science

DR. SYDNEY B. INGRAM, vice-president of the Engineering Manpower Commission of the Engineers Joint Council, has reported that America's shortage of engineering and scientific manpower is not temporary; it is chronic, continuing and permanent.

There just are not enough men with the gray matter necessary for first-rate scientific work, the New York scientist said.

"Our technical manpower has a definite limit," Dr. Ingram said. The United States thus must determine how to make maximum use of this manpower.

To successfully complete engineering studies, a student generally needs an IQ of 120 or better, Dr. Ingram said. Less than 20% of the population has this kind of brainpower. The engineering schools already get about one-fourth of the men in this group. The other professions must share the rest.

Dr. Ingram did not mean to say America should give up attempts to get more and better scientists and engineers. The United States must increase these attempts to get all who have the IQ to consider the sciences as a career.

"The idea that we've muddled through before and will again just won't work this time, because this problem is absolutely unique in the history of the world."

Dr. Ingram urged the best use of the engineers and scientists America can produce. At present, many engineers are forced to do the work they should have qualified technicians to do for them. The number of workers supporting the engineers and scientists must be increased.

Dr. Ingram also proposed:

1. Government and business should survey their use of their top manpower.
2. Public schools and colleges must offer improved teaching for the top students to maximize their usefulness.
3. High school guidance programs must be kept up to date on opportunities in science and engineering. Today, institutions for training engineering technicians are partly empty because many persons without the highest IQs are not informed of the opportunities in this work.

Dr. Ingram said the brainpower of America's women is not being directed into scientific and engineering fields, but he saw little chance of this being done within the United States' present social structure.

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PSYCHIATRY

"Happy College Days" Are Not So Happy for All

COLLEGE DAYS are not the carefree days most persons believe, a psychiatrist reports.

Many students find college life full of mentally disturbing problems. Furthermore, Dr. Melvin L. Selzer of the University of Michigan says, the public is not aware of the seriousness of such mental disturbances among the nation's college students.

The public's misconception may be due to the myth of "the happy college student" based on the superficial impression that everyone on campus is having a wonderful time, Dr. Selzer reports in the American Medical Association Archives of Psychiatry, Feb., 1960.

However, data accumulated at the University's mental hygiene clinic show that eight percent of the total student body visit the clinic annually. Of 506 students interviewed, 35.4% were psychoneurotic. These students suffered from combinations of anxiety, phobias, compulsions, obsessions and a tendency to shift mental conflicts to organic areas.

Of the remaining students, 24.5% had personality disorders while 21.7% were schizophrenes. Only 8.3% of the patients came to the clinic because of problems of adjusting to college environment.

Thus 81.6% of the patient group fell into the three major psychodiagnostic categories. Dr. Selzer says his survey indicates that students at college mental hygiene clinics are often underdiagnosed. This may be due to several reasons. For one, the busy thereapist, in concentrating on the immediate precipitating complaint, may obscure the presence of underlying pathology.

Other misleading factors may be the patient's youth, intellectual ability and academic prowess. It may be difficult to accept the idea that members of this group are emotionally ill.

Finally, there is the popular myth that college students are happy, the belief that campus life is a series of parties and games attended by a carefree, irresponsible student body.

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ENGINEERING

Electronic Spy Quickly Produces Aerial Photos

A FAST, sharp-eyed electronic spy has been developed for military reconnaissance aboard airplanes or missiles, and an advanced version may some day be blasted off in rockets.

The Photoscan System can produce within seconds an aerial picture measuring 2¼ by 2¼ inches with such sharpness that a ½-by-⅜-inch area can be enlarged photographically to an eight-by-ten-inch size with a high degree of recognizable detail.

The view seen by the device can be transmitted by radio either directly or through a relay to the sender, or it can be stored until a more convenient time. The special receiver reproduces the "spy" picture almost instantly for viewing and storage on film.

Developed by CBS Laboratories at Stamford, Conn., Photoscan works this way: A camera shoots the picture on a strip of film which runs through a quick-development process and then in front of a photomultiplier tube.

Photoscan's heart is a T-shaped tube that contains within its vacuum a spinning phosphor-coated drum. This spinning drum is bombarded by a high-powered beam of electrons to produce a brilliant phosphorescent spot. The spot sweeps the spinning drum from end to end. If the drum did not spin, the phosphor would be worn out promptly under the intense bombardment.

This brilliant spot is focused on the film by a moving lens, causing the spot to sweep the picture. The photomultiplier tube reacts to the changes in light it receives through the film and thus sends out an electrical version of the picture. This is amplified and radioed to the receiver on the ground.

Dr. Peter C. Goldmark, the Laboratories' president and director of research, said a visual reconnaissance payload for use in a reconnaissance rocket system has already been proposed.

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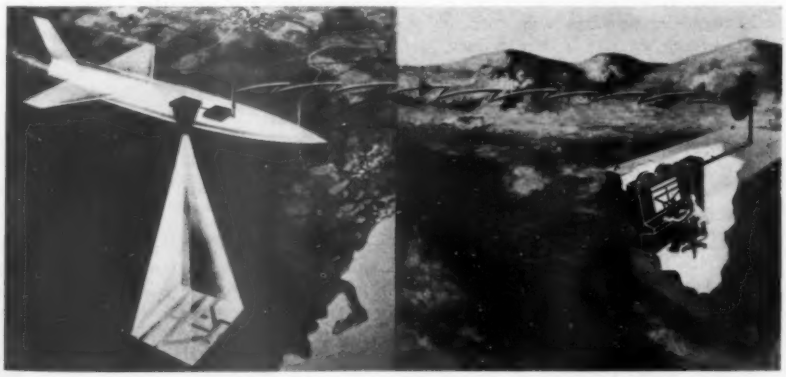

ELECTRONIC PHOTOSCAN—High resolution photographic or other visual information can now be transmitted nearly instantaneously from manned or unmanned aircraft to near or distant receiving stations by the use of the Photoscan System device developed by CBS Laboratories, Stamford, Conn.

FOOD TECHNOLOGY

Test for Food Additives

AEC suggests use of radioisotopes to help producers prove food coloring safety. Laboratory toxicity tests could be speeded up and more accurate results attained.

THE USE of radioactive isotopes could help food producers prove the safety of artificial food colorings, preservatives and processing methods.

In a special report on radioisotopes, the Atomic Energy Commission said many toxicity tests on laboratory animals could be speeded up and made to yield more accurate results through use of radioisotope tracer technology.

But the food industry is not familiar with the use of such tracers, no training center is devoted to instructing food technologists to use isotope techniques, and at present there are no inexpensive radiocompounds available that would be used in food tests, the report said.

To help correct the situation, the AEC has contracted with the Massachusetts Institute of Technology for a study directed toward putting isotopes to work effectively and economically in testing food additives for toxicity.

Radioisotopes particularly could be helpful in checking out food preparation techniques. The report said certain toxic materials on foods that normally would not enter the blood stream can be changed by a detergent into a form that permits their absorption.

More and more detergents and wetting agents are being used to wash soil, spoilage microorganisms, insects and chemical residues from raw food products before packaging for the consumer, the report said. These chemical washes are supposed to be removed by a final rinse with clean water.

Radioisotopes therefore could be used to evaluate food-washing practices and to establish procedures needed for complete removal of detergents. The National Canners Association is working on this problem under an AEC contract.

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VETERINARY MEDICINE

Blowflies Menace Sheep

THE BUZZING of millions of blowflies is the worst menace facing Australia's 150,000,000 sheep.

The sheep produce some of the finest wool in the world, which is worth an average $900,000,000 a year, or half the national export income.

The sheepman's blowfly is bronze green in color and known as *Lucilia cuprina*. It is responsible for 90% of the fly attacks in sheep. Each female is capable of laying from 2,000 to 3,000 eggs in its lifetime.

Veterinary officers of the N.S.W. Department of Agriculture estimate the blowfly menace cost the country $10,000,000 in 1938. If the losses had continued at the same rate, the losses would total $50,000,000 a year by now.

Lucilia cuprina is not a native of Australia, but was introduced in the early days of settlement. The blowfly began to thrive towards the end of last century when the Vermont strain merino was introduced from the United States.

The blowflies thrived on the thickly woolled U. S. imports, with their moist folds and wrinkles of fleece.

In a few years blowflies were causing enormous sheep casualties. Graziers found they attacked after rain when the fleece was damp.

Pastoralists daubed their livestock with repellents and dipped them in carbolic washes. Others tried sulfur and oil. But the relief granted was only temporary.

A blowfly committee of veterinary experts and entomologists studied the problem. It was decided that removal of the skin folds from each hind leg might reduce the menace. Large-scale trials were undertaken in 1938, and today the operation has become routine in the industry.

In post-war years aldrin and dieldrin increased the immunity period for sheep from blowfly ravages. But in recent years flies resistant to chemical protection have developed. Diazinon is now being used with increasingly improved results.

How long blowflies will succumb to their newest enemy is not known, but agricultural scientists believe the insect will ultimately develop resistance to it.

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GENERAL SCIENCE

U. S. Air Force Expands Science Fair Cooperation

YOUTHFUL eagerness to probe the secrets of space is getting an extra boost from the U. S. Air Force.

Expanding its existing program of recognition for outstanding work exhibited by teen-aged space scientists at the annual National Science Fair-International, the Air Force and the Space Education Foundation of the Air Force Association will honor students at each affiliated regional or state fair. Air bases will offer cooperation to science fairs, clubs and classes in their localities by providing such help as speakers and films, and through briefings, tours and open houses at the bases.

At each of 200 or more fairs affiliated with the National Science Fair-International, administered by SCIENCE SERVICE, five citation certificates will be awarded for the best projects in aerospace dynamics, meteorology, propulsion, electronics and aerospace power.

At the National Science Fair, to be held in Indianapolis, May 11-14, five plaques will be awarded for top level exhibits in these categories. One of the plaque winners will be selected to attend the annual convention of the Air Force Association in San Francisco next September as the honored guest of the Association.

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ASTRONAUTICS

First Spaceman Cooled By "Pulsating Sponge"

A "PULSATING" vinyl plastic sponge will help keep America's first man in space cool.

The sponge will absorb perspiration given off in the body-cooling process. The sponge will be automatically squeezed at intervals by a mechanical squeezer.

This detail and others, relating to how scientists plan to keep the Mercury astronaut alive for three orbits around the earth, was reported in a House of Representatives Committee on Science and Astronautics staff report on Project Mercury, the U. S. man-in-space program.

The astronaut will have two oxygen supplies sufficient to sustain life for up to 56 hours. They will keep the space capsule pressurized in normal flight, or will pressurize his space suit in an emergency. The second oxygen supply will be switched into the system automatically when the first supply runs out.

The oxygen supplies will be connected to a closed pressure-suit circuit and a cabin pressure regulator valve. The pressure suit connections are at the torso and helmet. A lithium hydroxide canister will remove carbon dioxide and odors, a blower will circulate the oxygen, a water-boiling type of heat exchanger will remove the spaceman's heat output and the "pulsating" sponge will soak up body moisture.

The cabin will be pressurized to five pounds per square inch. (Sea level air pressure is 14.7 pounds per square inch.) It also will have a blower and a heat exchanger to remove heat generated by electrical equipment.

Normally the astronaut will fly with his suit ventilated but not pressurized. If the capsule's pressure fails, the spaceman's suit will be pressurized to five pounds per square inch. He can live for 56 hours this way. If the cabin pressure fails and the closed suit-circuit fails also, oxygen will automatically pass through the suit and exhaust into the cabin. He can live three to six hours. If the suit circuit alone fails, he can breathe the cabin's oxygen.

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BIOLOGY

Lamb in Germfree Lab

A PREGNANT EWE from a southern Michigan farm will soon travel to Notre Dame, Ind., to have her "baby."

This will be no ordinary birth, and the baby lamb will be no ordinary lamb. It will be taken from the ewe, uterus intact, through a germicidal bath to guarantee that the lamb will be completely "germ-free," Dr. Philip Trexler of the Lobund Laboratories, University of Notre Dame, said.

The "immaculately clean" lamb will be raised in a sterile room at the laboratory. When the lamb reaches the age of three months, it will have a perfectly developed rumen.

The rumen is a "stomach" peculiar to those animals that chew a cud. Vegetation partially chewed by these animals passes to the rumen where it is stored until the animal can regurgitate the food. The animal can, at rest, rechew the food and mix it with more saliva before it is swallowed.

When the germfree lamb is three months old, it will be fed a special diet that scientists expect will be identical to the food the lamb normally would process with the aid of naturally occurring bacteria in the rumen.

Scientists will observe the growth pattern of this lamb when fed food exactly matching the food the animal would produce in a conventional stomach. It is not yet known whether or not the lamb will be nourished sufficiently on this diet.

Presently, Dr. Trexler is observing a 60-day-old germfree lamb. This animal will be killed when it is 90 days old and its rumen is fully developed. Since the rumen of this animal will be bacteria-free at that time, the lamb will not be able to ferment its food. It will not be fed the special diet food its successor will receive.

So far, scientists have learned from this animal that, in the germfree environment, the lamb is capable of utilizing protein at nearly 100% efficiency.

They also suspect that bile is decomposed by bacteria present in the animal, since bile produced by this lamb turns up in the animal's experiments.

Dr. Trexler said that there are between 1,500 and 2,000 animals in the Lobund germfree division. They include chickens, mice, rats, rabbits, guinea pigs and sheep.

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TECHNOLOGY

Fuel Cell Report Is Gone Again

THE EXCITING potential of fuel cells, which soon may give birth to exhaust-free electric cars, is reflected by the speed at which industry is snapping up a Government report on these promising sources of electricity.

The Office of Technical Services, operated by the U. S. Department of Commerce, said that a "Status Report on Fuel Cells" is the Office's present best seller. Since the report first appeared in June, 1959, it has sold 1,500 copies, making the report one of the best-sellers for the last five years.

The 116-page report has now sold out for the second time since June and has gone into its third printing.

Prepared by B. R. Stein for the Army Research Office, the report is the first of a projected series aimed at collecting and reviewing "all available information in this field."

It covers all of the Army's fuel cell research now proposed or in the hopper, and attempts to compile similar data involving other agencies.

In addition to surveying recent advances, the report describes and discusses known fuel cell systems, heat considerations, production, storage and handling of fuels, and summarizes Government research contracts.

The fuel cell report, No. PB 151804, is priced at $1.25 under the Office of Technical Services' policy of breaking even by recovering printing costs.

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NEW SAC BOMBER—This newest member of the Boeing B-52 family, the B-52 H missile bomber, is being built for the Air Force for use by the Strategic Air Command. The first completed aircraft will roll out at the Boeing Wichita, Kans., Division early next year.

BIOLOGY

Slime Mold Studies Show DNA Increases

DNA, one of the basic life compounds and the protein that makes up the chromosome, is not the "trigger" that sets off cell division.

Actually, there is an increase in the synthesis of DNA, or deoxyribonucleic acid, immediately after the nucleus divides, a team of University of Wisconsin researchers reported. Since each daughter cell contains chromosomal material equal in quantity to what the parent nucleous contained, the DNA in cell nuclei must double, Dr. Harold P. Rusch said.

This doubling had been thought to be the mechanism that started cell division. Now it appears that the cytoplasm, the material surrounding the nucleus, must influence cell division.

Dr. Rusch and his associates, Oddvaar F. Nygaard and Sophia Guttes, also of the University, used a slime mold called Physarum in their experiments.

Mr. Nygaard is now at the Western Reserve University.

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MEDICINE

Cancer Called Next to Worst Child Killer

CANCER is responsible for the deaths of more American children than any other cause except accidents. At present, 12% of all deaths occurring in children between the ages of one and 14 are caused by various forms of cancer, including leukemia.

An article in *Therapeutic Notes* states that a significant number of malignant tumors are present at or before birth. However, far greater numbers of cancer are detected clinically in children under the age of five years. More than one-half of all cases of childhood leukemia occur before five years of age.

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TECHNOLOGY

Nuclear Reactor to Aid Economical Electricity

A GAS COOLED nuclear reactor now being built is expected to leapfrog some drawbacks of existing atom plants and land close to the electric utility industry's goal of generating economical power with atomic energy.

The High Temperature Gas-Cooled Reactor (HTGR) on the Susquehanna River in southeastern Pennsylvania is to be completed in 1963. Its development and operation are expected to show short-cuts to competitive electricity production using atomic fuels.

Dr. Peter Fortescue and Corwin L. Rickard of General Dynamics Corporation's General Atomic Division in San Diego, Calif., told an American Nuclear Society symposium in Philadelphia, Pa., that high performance is expected from this prototype plant because it is technically simple and compact.

Its hot core will heat the helium gas coolant to 1,380 degrees Fahrenheit, enabling steam to be generated at 1,000 degrees and pressures of 140 pounds per square inch or higher. These steam conditions approach those now used by modern, efficient turbine-driven generators.

The 40,000-kilowatt prototype is being built for 53 private utilities in 31 states and the District of Columbia. It will have a high degree of inherent safety.

This prototype itself is not expected to produce a kilowatt-hour for seven mills, but rather to show the way to short-cuts that will lead to economical, 300,000-kilowatt nuclear power plants.

Participating in the symposium were nuclear experts from England, Australia and Russia, as well as from U. S. industry and Government.

Science News Letter, February 20, 1960

MEDICINE

Study Links Asian Flu, Abnormal Births

THE BELIEF that infection from Asian flu during pregnancy can cause abnormal births has been supported by the research of a British doctor.

A study was made in Northamptonshire of 43 pregnant women who had Asian influenza during their pregnancy. The illness was severe enough to cause 38 of them to be bedridden. They were in bed an average of five days, Dr. M. J. Pleydell, formerly Deputy County Medical Officer of Health, Northamptonshire, reports in the British Medical Journal, Jan. 30, 1960.

The illness afflicting these women consisted of headache, fever, pain in the limbs, depression and "typical influenza" symptoms, patients' records revealed. The British researcher cautioned that no attempt was made to identify the organism responsible for the illnesses.

The mothers did, however, suffer from a fever-causing disease with signs and symptoms similar to influenza between Sept. 1, 1957, and Dec. 31, 1957, when Asian flu had reached epidemic proportions in England.

The babies of these mothers were compared with the babies of 1,040 pregnant "control" mothers also selected during the flu epidemic.

Histories of the 43 showed that: Of 12 mothers who had Asian flu during the first three months of their pregnancy, one gave birth to a baby with hydrocephalus, excessive fluid in the brain cavity, a second aborted at the fourth month of pregnancy and a third aborted at the sixth month. Of 18 babies born to mothers who had flu between the fourth and sixth months of pregnancy, one baby had congenital heart disease and another baby died of bronchopneumonia. Of the 13 mothers who had flu during the last three months of pregnancy, one gave birth to a baby with hydrocephalus and spina bifida, a cleft in the vertebral column.

Fourteen percent of the babies born to the 43 women were abnormal compared to only five percent of the babies in the "control" group.

It therefore seems "reasonable to suggest that there may be an association between Asian flu in pregnancy and congenital abnormality," Dr. Pleydell concludes.

Dr. Pleydell is now County Medical Officer of Health, Oxfordshire.

Science News Letter, February 20, 1960

BIOLOGY

Discover Deep Sea Fish Off Southern California

A NEW SPECIES of long, black, deep-sea fish has been discovered off the coast of southern California.

Known scientifically as *Lestidium johnfitchi*, it resembles a small barracuda in appearance, but is not closely related to that voracious species. It was caught in a net full of jack mackerel at a depth of about 90 feet.

The fish, which has a long, slender body with 98 vertebrae, was discovered by John E. Fitch (hence the name) of the California Department of Fish and Game. It is reported in Copeia, 284, 1959, journal of the American Society of Ichthyologists and Herpetologists, by Robert R. Rofen of the George Vanderbilt Foundation at Stanford University, Stanford, Calif.

Two other marine species are described for the first time in the same issue of the journal.

Victor G. Springer of the Florida State Board of Conservation Marine Laboratory, St. Petersburg, reports discovery in the Caribbean Sea of a small three-inch reef fish. It resembles the scaled blennies and has been given the scientific name *Labrisomous filamentosus* because of its long, filamentous first three dorsal spines.

Discovery of a new eel from a coral head off the coast of southern Japan is reported by Kiyomatsu Matsubara and Hirotoshi Asano of Kyoto University, Maizuru, Japan. About 10 inches long, it has been called *Kaupichthys japonicus*.

Science News Letter, February 20, 1960

IN SCIENCE

PUBLIC HEALTH

Launch Allergy Program To Aid Sufferers

A NATION-WIDE effort is under way to help the 17,000,000 Americans who suffer from allergies.

Its aim is isolation and standardization of the precise substances—called allergens—that cause allergic symptoms such as sneezing, asthma and rashes.

A committee of the U. S. Public Health Service's National Institutes of Health, consisting of allergists and immunochemists from a number of medical institutions, will direct the program. Its chairman is Dr. Dan H. Campbell of the California Institute of Technology in Pasadena, Calif.

Because it is the number-one offender allergically, ragweed will be studied first. Several pounds of pollen from dwarf ragweed plants will be dried at room temperature in a vacuum, which should allow it to retain its allergen potency for many years.

The products of the pollen will be broken apart and tested on hundreds of persons. Dr. Campbell is convinced that a certain fraction of ragweed is by far the chief culprit in the plant.

After the committee has succeeded in standardizating ragweed, it will start on grasses, including Bermuda grass. Another early target of the committee will be ordinary house dust, which contains a certain polysaccharide believed to be the chief offender from this source of hay fever.

The program has been planned for a year and the committee believes it has the full cooperation of clinical allergists and researchers throughout the country. Success of the project is expected to require years of concentrated effort.

Science News Letter, February 20, 1960

PHYSICS

First-Graders Could Learn Nuclear Physics

FIRST-GRADERS might profitably be taught fundamental nuclear physics, Dr. Donald J. Hughes, senior physicist at Brookhaven National Laboratory, Upton, N. Y., said.

He reported that even nuclear physicists find it difficult to think in terms of the inside of an atom because "common sense," based on experiences in the larger world of man, interferes.

Much of the "strange stuff" about the atom could be grasped at age six, he told science writers at a seminar at Ardsley-on-Hudson, N. Y. Children can grasp the unorthodox, he said, and perhaps grow up without the mental blocks adult experts admit to.

Science News Letter, February 20, 1960

NCE FIELDS

MEDICINE

Seven-Year-Old Dies After Skunk Bite

A SEVEN-YEAR-OLD BOY was bitten by a skunk on the left index finger last September near his home at Port Perry, Ontario, Canada.

The wounded finger was cleansed and dressed, and the boy received tetanus toxoid just hours after the mishap. The animal was not caught for virological examination. More than three weeks passed without incident to the boy, four doctors report in the Canadian Medical Association Journal, 82: 315, 1960.

However, on approximately the 23rd day after the boy was bitten, he complained of a burning sensation over his body coupled with extreme sensitivity to pain. Within ten more days the boy was suffering shooting pains in his arms and body.

He was unable to sit up and soon became weak. Two days later he entered Toronto's Hospital for Sick Children where he grew progressively worse, lost consciousness and, on the third day of hospitalization, died.

Examination of the child's central nervous system revealed presence of Negri bodies, conclusive proof of rabies. At no time had the child exhibited symptoms of hydrophobia, fear of drinking water, the authors pointed out.

Less than 50% of persons bit by animals confirmed as rabid by laboratory tests contract rabies. This little boy was one of that number.

The case is reported by Drs. D. M. McLean, V. W. Krause, W. M. Wilson and W. A. Hawke, all from the Toronto hospital.

Science News Letter, February 20, 1960

MEDICINE

"Stomach Flu" Is Not Influenza at All

IF, DURING this flu season, you have stomach or intestinal "flu," chances are you do not have influenza at all.

Nausea and vomiting, typical of so-called "stomach flu," occur in only every tenth case of infection from true influenza virus, Drs. George Gee Jackson and Harry F. Dowling report.

The chief symptoms of influenza are, by medical statistics as well as the recollection of many millions of nonprofessionals, fever, headache and general discomfort. These symptoms affect 80% to 90% of influenza victims, the University of Illinois College of Medicine scientists reported. They are co-authors of an article on acute respiratory infections in the World-Wide Abstracts of General Medicine, 3:8, 1960.

Influenza is self-limited, usually lasting three to four days. Severe influenza infection can produce rapid death. In other patients, however, prostration and weakness may last for days or weeks after the fever and respiratory symptoms have gone.

Gastrointestinal symptoms, except perhaps with influenza C virus, are not characteristic of influenza infection, the Chicago physicians said. Thus the term gastrointestinal flu is a misnomer.

The cause of common acute respiratory infections remains unknown and not identifiable in four out of five cases, they reported.

However, the rapid advances being made in our knowledge of the viral causes will lead to better methods of recognition, treatment and prevention, they predicted. Antibiotics already available permit effective treatment of most of the bacterial infections.

In both known and unknown types of infection, they said, the family doctor is the person who must coordinate the knowledge and institute the appropriate use of drugs and vaccines.

Science News Letter, February 20, 1960

ANTHROPOLOGY

Tooth Linked With "Nutcracker Man"

A GIANT TOOTH, reported found in 1958, and thought at the time to be related to that of Peking Man and Heidelberg Man, is now believed by its discoverer, Dr. L. S. B. Leakey, to be that of a descendant of "Nutcracker Man," or Zinjanthropus, a primitive man more than 600,000 years old.

Zinjanthropus boisei was found in Olduvai Gorge, Tanganyika, East Africa, in July, 1959, about a year after the giant tooth came to light. Dr. Leakey of Coryndon Museum, Nairobi, Kenya, named the Zinjanthropus, also called "Nutcracker Man" because of his huge, human-type teeth.

Some authorities conclude that the molar found in 1958 belonged to one of the australopithecines, a primitive group of Near-Men that lived even earlier than Zinjanthropus.

With the giant molar was also found a canine tooth. Dr. Leakey believes that the relative size of the molar to the canine is comparable to that of Zinjanthropus and, to a much lesser extent, to that of the australopithecines.

The man to whom they belonged may well have been a descendant of Zinjanthropus and a man of a more modern type, Dr. Leakey reports in Nature, 185:408, 1960.

The australopithecines are not generally accepted as true men, because, although they had many human traits, they had very small brains. Their pebble tools have been termed makeshifts by anthropolgists and investigators in the field.

Yet some anthropologists now believe their pebble tools were the first crafted tools, and that the australopithecines spread widely and evolved into a type with a larger brain such as Peking Man.

Science News Letter, February 20, 1960

MEDICINE

Tranquilizers Predicted As New Suicide Method

TRANQUILIZERS are becoming more popular as a method of committing suicide, a New York doctor reports.

Just as the barbiturates superseded bichloride of mercury in 1935, so it is safe to predict that tranquilizers may one day soon replace the barbiturates as an important agent of choice in suicide, Dr. Joseph Hirsh predicts in Mental Hygiene, 44:3, 1960.

The Yeshiva University associate professor refers to seven reports of overdoses of meprobamate and their poisoning effects.

There has been little actual change in the fashions of suiciding over the centuries, he notes. The basic methods still involve the use of cutting and stabbing instruments, guns, crushing as a consequence of leaping from a height or beneath a vehicle, various methods of traumatic asphyxiation and poisons.

A breakdown of these methods among some 32,000 suicides in New York City between 1925 and 1954 reveal that:

Gas was the choice for 11,038; hanging for 6,241; jumping from heights, 4,680; poison, 4,104; firearms, 2,848; cutting and stabbing, 1,150. The remainder was divided among drowning, crushing (beneath trains) and other methods.

Science News Letter, February 20, 1960

OCEANOGRAPHY

Silicon Isotope May Date Ocean Phenomena

A RADIOACTIVE isotope of silicon that shows promise as a means for dating oceanographic phenomena has been found in marine sponges in the Gulf of California.

Known as silicon-32, the isotope is produced by cosmic rays and has a half-life of roughly 710 years. It is believed to be found principally in the oceans, deposited there by rain.

Discovery of the isotope in the sponges is reported in Science, 131:332, 1960, by Drs. Devendra Lal, Edward D. Goldberg and Minoru Koide of the Scripps Institution of Oceanography, La Jolla, Calif.

Such isotopes as carbon-14, hydrogen-3, beryllium-10, and phosphorus-32, also produced by cosmic rays, have previously led, on the basis of their distribution and concentration in different areas of the earth, to many significant concepts in geochemistry and geophysics. It is hoped that silicon-32 will prove equally valuable.

Its use as a tracer could facilitate studies of mixing times between deep water and surface water, the scientists report. It could also be used to study ages of the polar ice caps, rates of accumulation of rapidly growing siliceous sediments, individual characteristics of water masses within oceans, and changes in cosmic ray intensity with time during the last few thousand years.

Science News Letter, February 20, 1960

MEDICINE

Heart Disease Today in the U. S.

Someone dies of heart disease almost every two minutes in the United States. A study revealed that Americans are overweight, but persons who lose weight may live longer.

By HELEN BUECHL

AS IF AMERICANS did not have enough to worry about, they learned recently that they are, on the average, overweight.

This might not be so bad except that statistics show the fatter you are, the more likely you are to die early in life. This same comparison can be made with high blood pressure—the higher it goes, the earlier you go. If you are a male, especially over 30 years of age, you are more susceptible!

Coronary heart disease has become the leading cause of death in men 30 years of age and older in the U.S. This disease is highest in the Western world, and highest in the U.S. Two people die from it every minute in the U.S.

By 1955 coronary heart disease was highest in New York State. And it was ten percent higher in New York City than the rest of the state.

Studies in various countries throughout the world indicate that there is a relationship, mysterious though it may be, between the amount of fat consumed by each person in a country and the incidence of death due to coronary heart disease in that country.

The relationship remains a mystery because medical scientists believe that the amount of cholesterol in the blood stream causes much of the coronary heart disease, but they do not know just how.

Clots Cause Heart Attacks

Coronary heart disease, or "heart attack," usually occurs when a blood clot forms in a heart artery hardened and narrowed by the accumulation of fatty substances. These substances are lipids in the blood stream. Cholesterol appears to be the biggest troublemaker among these lipids.

Medical researchers know that there is a relationship between high blood-cholesterol levels and occurrence of heart attacks.

They have found that middle-aged men with high cholesterol levels get heart attacks three to six times as often as men with normal levels of the fatty substance.

The cholesterol level in normal persons is between 150 and 250 milligrams per milliliter of serum. Anything above this level is undesirable.

In order to determine just what could be done to control skyrocketing and dangerously high cholesterol levels, especially among the most likely candidates for a coronary, the Department of Health of New York City a few years ago formed "The Anti-Coronary Club."

There are 600 members of this all-male club, each between the ages of 20 and 59. Approximately 60% of the members are in the highly susceptible 50 to 59 year age group, 20% are in the 40 to 49 year age group and the remaining 20% are in the 20 to 39 year age group.

Each member of the club has accepted the responsibility of following a specific diet pattern for a period of years to establish whether or not a controlled diet will lower cholesterol levels and increase expected longevity.

The diet consists of foods high in protein content such as cottage cheese, chicken, turkey, veal, egg whites and fish. "Fatty" foods, such as pork, are eaten with the visible fat removed.

Members who are overweight are placed on special weight reducing diets.

One member, whose weight was 168 pounds at the start of the study and diet, had a dangerously high cholesterol level of 350. Six months of prudent dieting in the "club" brought this level down to 288, while he lost only two pounds.

The first recorded suspicion that cholesterol is the villain in heart disease was in 1913, by a team of Russian investigators. However, there is as yet no conclusive proof that cholesterol is responsible. Many medical researchers do suspect that high cholesterol levels in the blood stream are responsible for the fatty deposits that clog the arteries and cause them to be shut off.

For some reason that can only be guessed at, women before the menopause have lower blood cholesterol levels than men; after the menopause the rates are about the same for both sexes. Some experts believe hormones work in women's favor, keeping the level down. Injections of female hormones in males to lower cholesterol levels have not proved successful, however.

Very few women in the age groups before the menopause die of atherosclerosis. Now, the Society of Actuaries report reveals that women weigh distinctly less than a generation ago. This might also influence the lower incidence of heart disease among women.

At any rate, latest statistics show that the luckiest person is he who has below average blood pressure. Both men and

NO MORE WHIPPED CREAM—Expressing concern over the weight registered on the scale, this American knows that by reducing he can help himself avoid heart diseases such as atherosclerosis and high blood pressure. Statistics reveal that the American male is growing heavier to the detriment of his health.

women in this group have the lowest mortality rates. High blood pressure means trouble.

Some physicians believe that stress causes high blood pressure. This in turn damages the heart. The types of stress related to that of masses of people moving upward economically with most persons feeling a duty to elevate themselves and their children to a higher economic and social group, the stress of failing to escape from the boom, chatter and jangle of television, radio and the telephone, all may represent a newer type of strain to which mankind is making but poor adjustment, one researcher pointed out.

The Heart Disease "Type"

Is there such a thing as a heart disease "type" of personality? Can scientists determine who is most prone to heart disease? A study by the Massachusetts General Hospital of coronary patients under 40 years of age revealed this composite portrait of the heart disease candidate:

He is a husky, robust male. His chest, trunk, face and hands are noticeably thick for their length, and he has a lot of hair on his body if not on his head. He was a good athlete in school and, although he is too busy for regular exercise now, he is apt to indulge in strenuous workouts whenever he gets a chance.

He is objective, realistic, matter-of-fact, conscientious, and sympathetic enough for women to call him "sweet."

But underneath, he is always in a hurry. He walks like a man who knows where he's going and is eager to get there. He seldom takes a vacation, works rather than plays at his hobbies, saves time by talking business at lunch. He looks as if he is in control of himself and the situation, but his wife may report that he falls into violent fits of temper if he is delayed or crossed.

He drinks and smokes more than most men. The odds are that he is a rising professional man or business executive who provides well for his family and could pose for a picture of the model father.

He looks and acts ten years older than his age. He may be prematurely gray, wrinkled or bald. He gives the impression that he has worked himself old before his time. Sound like someone you know? Tell him to slow down.

Science News Letter, February 20, 1960

DERMATOLOGY

Skin Eruptions Affected By Many Factors

A CHANGE of scene or workmen's compensation may be more potent in curing a skin eruption than the best treatment the dermatologist can offer.

The case histories of some 3,000 industrial workers point to at least 30 reasons why a patient's skin may not clear up after the original cause is removed, Dr. George E. Morris of Tuft Medical School reported.

He told scientists attending an America Academy of Dermatology and Syphilology meeting in Chicago that workmen's compensation seems to slow the recovery of some patients. They find they can receive almost as much money by not working as they did while working. Another patient had suffered a disabling dermatitis for two years which cleared quickly when he learned that only healthy workers would be transferred to another location.

Other reasons given by Dr. Morris concerning why a patient may fail to respond to treatment: 1. serious nervous upset; 2. sensitivity to chemicals, particularly to one structurally related to the chemical that caused the original eruption; 3. vitamin deficiencies; and 4. excessive heat or cold.

Overtreatment and the use of certain antibiotics can also influence the patients response, Dr. Morris said.

Science News Letter, February 20, 1960

MEDICINE

Blood Vessels Dilate After Heart Attack

THE SHOCK that follows an acute heart attack may be due to a disturbance in the blood vessels, preliminary observations with a new procedure indicate.

The vessels may actually dilate rather than constrict, three investigators reported. It was once believed that development of shock was related entirely to the severity of heart damage.

The new procedure consists of a mobile unit, wheeled to a patient's bedside shortly after an attack, Drs. Maxwell J. Binder, L. E. Scaduto and Morton L. Pearce of the University of California Medical Center and the Veterans Administration Center of Los Angeles, Calif., said. A green dye technique measures the heart's output and blood pressure measurements are taken. So far, 22 patients have been studied with the device 24 to 48 hours after their attack. Surviving patients are restudied when they are fully ambulant.

Science News Letter, February 20, 1960

ELECTRONICS

Tiny Thermistor Will Pass Through Needle Eye

See Front Cover

THE MIDGET BEAD thermistor, seen on the cover of this week's SCIENCE NEWS LETTER, is employed in electronics equipment for measuring temperature on the inside and outside surfaces of the Polaris and Atlas missiles. It is so small that it easily passes through the eye of an ordinary needle.

The bead thermistor is .010 inch in diameter and is mounted on a wire .001 inch thick. One pound of these instruments, manufactured by Gulton Industries, Inc., of Metuchen, N. J., would have a value of $1,000,000.

The thermistors can be used in medical applications inside a hypodermic needle to measure blood temperature. They are also used in radio frequency power measurements in the microwave field and in the measurement of low gas pressures. They can measure temperatures between minus 76 degrees and 572 degrees Fahrenheit.

Science News Letter, February 20, 1960

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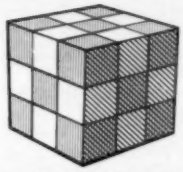

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ALLERGY: What It Is and What to Do About It—Harry Swartz—*Ungar*, rev. ed., 232 p., $3.95. Allergist discusses all aspects of allergy and latest developments in therapy, for general reader.

THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC for the Year 1961—U.S. Naval Observatory, Nautical Almanac Office—*GPO*, 523 p., $4. Prepared jointly with H. M. Nautical Almanac Office, Royal Greenwich Observatory.

ATOMS: The smallest Particles and The Energy They Contain—Jerry Korn—*Golden Press*, 56 p., illus. by N. Van Houten, de luxe $1; 50¢. For young people.

BIRDS FROM GABON AND MOYEN CONGO—Austin L. Rand, Herbert Friedman and Melvin A. Traylor, Jr.—*Chicago Nat. Hist. Mus.*, 411 p., paper, $3.50. New study of birdlife of western Africa.

CEMENTED CARBIDES—Paul Schwarzkopf and Richard Kieffer—*Macmillan*, 349 p., illus., $15. Deals with composites of pure refractory material and binder metal of high ductility, including ceramic tool materials.

CLINICAL PHARMACOLOGY AND THERAPEUTICS, Vol, I, No. 1—Walter Modell, Ed.—*Mosby*, 136 p., paper, bi-monthly, $12.50 annually. Articles on problems in the evaluation of the actions and effects of drugs on man.

DESCRIPTIONS OF TADPOLES OF MIDDLE AMERICAN FROGS—Priscilla Starrett—*Mus. of Zool., Univ. of Mich.*, 48 p., illus., paper, $1.10.

EDISON AND OTHER EXPERIMENTS YOU CAN DO—Marjorie Van de Water, foreword by Walker L. Cisler—*Int'l Edison Birthday Celebration Committee (Science Service)*, 32 p., illus., paper, 25¢. Basic experiments from original notebooks of famous experimenters.

FIRST INTO OUTER SPACE—Theodore J. Gordon and Julian Scheer—*St. Martins*, 197 p., illus., $3.95. Detailed story of preparation and countdown for Thor Able missile which carried the first Pioneer about 71,000 miles into space.

THE FORD FOUNDATION ANNUAL REPORT 1959: To Advance Human Welfare—Henry T. Heald, Pres.—*Ford Foundation*, 180 p., illus., paper, free upon request direct to publisher, 477 Madison Ave., New York 22, N.Y. Program reviews.

HANDBOOK OF AGING AND THE INDIVIDUAL: Psychological and Biological Aspects—James E. Birren, Ed.—*Univ. of Chicago Press*, 939 p., illus., paper, $12.50. Authoritative technical summary of the scientific literature on the individual or behavioral aspects of human aging.

HANDBOOK ON BULBS—R. W. Oliver, Ed.—*Brooklyn Botanical Gardens*, 96 p., illus., paper, $1. Contains illustrated dictionary of bulbs and many articles about planting, forcing and growing of bulbs.

HOW TO USE METERS—John F. Rider and Sol D. Prensky—*Rider, J. F.*, 2nd rev. ed., 210 p., illus., paper, $3.50. Up-to-date information on electronic meter instrumentation.

ILLUSTRATED FLORA OF THE PACIFIC STATES: Washington, Oregon, and California, Vol. IV, Bignonias to Sunflowers—Leroy Abrams and Roxana Stinchfield Ferris—*Stanford Univ. Press*, 732 p., illus., $17.50. Includes 1,124 species of fern, herb, tree and shrub known to grow wild in the region, with index to all four volumes.

INTERNATIONAL DIRECTORY OF RADIOISOTOPES, Vol. II: Compounds of Carbon 14, Hydrogen 3, Iodine 131, Phosphorus 32 and Sulphur 35—*IAEA (Int'l Publications, N.Y.)*, 213 p., paper, $3. In alphabetical order lists synonyms and suppliers in U.S. and abroad.

INTRODUCTION TO PLANT PHYSIOLOGY—Bernard S. Meyer, Donald B. Anderson and Richard H. Bohning—*Van Nostrand*, 541 p., illus., $7.50. Condensed version of Meyer and Anderson's "Plant Physiology," with new material covering recent advances.

LANDSCAPE PLANTS THAT ATTRACT BIRDS—G. Wm. Longenecker and Robert Ellarson—*Univ. of Wis., College of Agric.*, rev. ed., 10 p., illus., paper, 10¢. Send directly to publisher, Madison, Wis.

LIMITS OF ALLOWABLE CONCENTRATIONS OF ATMOSPHERIC POLLUTANTS, Book 3—V. A. Ryazanov, Ed., transl. from Russion by B. S. Levine—*OTS*, 146 p., paper, $3.

A LOOK AT JUVENILE DELINQUENCY—Lincoln Daniels, foreword by Katherine B. Oettinger—*Children's Bureau (GPO)*, 50 p., illus., paper, 25¢. Addressed to general public.

MARRIAGE: East and West—David and Vera Mace—*Doubleday*, 359 p., $4.50. Examines the marriage relationship in Asia, traditional and contemporary.

MINERAL EQUILIBRIA at Low Temperature and Pressure—Robert M. Garrels—*Harper*, 254 p., $6. About chemical relations in aqueous solutions at low temperatures and pressures.

NATURAL AREAS FOR SCHOOLS—Verna R. Johnston, foreword by John F. Shrawder—*Conservation Educ. Section, State Dept. of Natural Resources*, 32 p., illus., paper, single copies free upon request direct from publisher, Sacramento 14, Calif. Shows how pieces of wilderness can be acquired and used in teaching.

PLANETS: Other Worlds of Our Solar System—Otto Binder—*Golden Press*, 56 p., illus. by George Solonevich, de luxe $1; 50¢. Factual information for young people.

PRENATAL AND PARANATAL FACTORS IN THE DEVELOPMENT OF CHILDHOOD READING DISORDERS—Ali A. Kawi and Benjamin Pasamanick—*Child Development Publications*, 80 p., paper, $3. Investigates hypothesis that childhood reading disorders may be consequent to minimal cerebral injury during prenatal and paranatal periods.

A PRIMER ON TELEVISION TAPE RECORDING—George B. Goodall—*Robins Industries*, 47 p., illus., paper, $1. Basic principles and special techniques, editing, splicing and duplicating of video tapes.

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Science News Letter, February 20, 1960

ASTRONOMY

Earth Bacteria Could Survive Moon's Heat

EARTH-VARIETIES of bacteria are rough and tough enough to survive extreme temperatures on the moon, two researchers have reported.

Thus man-made rocket ships might carry bacteria to the moon where they will thrive, Drs. Stephen Zamenhof and Sheldon B. Greer, biochemists at Columbia University's College of Physicians and Surgeons, said.

They found that many types of bacteria can survive heat as intense as that presumed to exist in sunlight on the surface of the moon. Many scientists believe this temperature to be well above the boiling point of water on earth.

The two men found that many bacteria survived in a vacuum when the heat reached 275 degrees Fahrenheit, 63 degrees above the normal boiling point of water at sea level.

Many bacteria should be able to survive in the dry state of a vacuum on the moon's surface, the scientists believe. Dr. Zamenhof's report appears in the Proceedings of the National Academy of Sciences, 46:101, 1960.

It was previously assumed by most scientists that only bacteria spores survived high temperatures. Spores are forms of bacteria extremely resistant to heat, chemicals and radiation.

"But now we see that in space—a vacuum—dry bacteria can be almost as hardy as spores," Dr. Zamenhof said.

This information could mean that earth-bacteria are now growing on the moon if the decontamination processes of the Russians failed. U.S. scientists assume, however, that the Russian rocket that crashed on the moon last September was sterile.

If the Soviet missile was not sterile, it may spoil chances of determining whether any organisms found on the earth's satellite originated during the early stages of the development of the solar system.

Science News Letter, February 20, 1960

PUBLIC HEALTH

More Males Have Impaired Hearing

MORE THAN 5,800,000 Americans have some degree of hearing loss, including nearly 110,000 who are totally deaf. Forty of every 1,000 males have impaired hearing, a rate one-third higher than that for females, data from the Metropolitan Life Insurance Company show.

This higher rate among males is attributed to their more frequent involvement in accidents and their greater exposure to prolonged intense noise in industry.

Science News Letter, February 20, 1960

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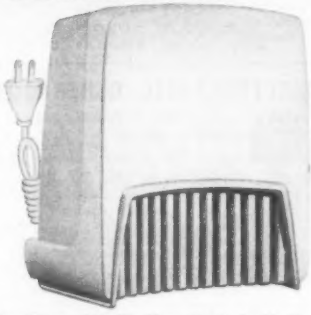

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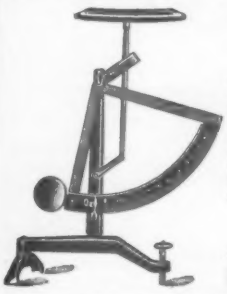

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VETERINARY MEDICINE

Virus Similar to Flu Found in Sick Cattle

A VIRUS similar to those causing human mumps and influenza has been found in cattle showing symptoms of a respiratory infection known as shipping fever.

Study of its transmission may provide a valuable model for the transmission of viral respiratory diseases in man.

Isolation of the virus, known as myxovirus parainfluenza 3, gives further evidence that viruses may be an important cause of shipping fever in cattle.

This disease is so called because it occurs often in cattle that have been shipped long distances and subjected to greater than normal stress.

The virus was isolated from the nasal secretions and diseased lungs of 15 calves and older cattle from 1957 through 1959.

The findings are reported in the American Journal of Hygiene, Jan., 1960. Drs. F. R. Abinanti and R. J. Huebner, National Institutes of Health, Bethesda, Md., Drs. R. J. Byrne, L. J. Poelma and F. R. Lucas of the University of Maryland, department of veterinary science, and Dr. R. L. Watson, U.S. Public Health Service's Communicable Disease Center, Atlanta, Ga., co-authored the report.

Science News Letter, February 20, 1960

Do You Know

States in which at least 60% of the population lives in rural areas increased their proportion of *doctors* from 82 per 100,000 people in 1950 to 84 per 100,000 in 1958.

At the end of 1958, the world's population of *children* less than 15 years of age was 1,065,000,000.

About one in every 100 school-age children has had *rheumatic fever*.

Irrigation needs alone require about half the fresh water used in the U.S.

Questions

MEDICINE—By what new method are doctors directing new blood supplies to the heart muscle? p. 115.

PSYCHIATRY—What is the myth of the "happy college student" based upon? p. 117.

VETERINARY MEDICINE—What insect is menacing Australia's sheep supply? p. 118.

BIOLOGY—How will the lamb soon to be delivered to Notre Dame differ from other lambs? p. 119.

Photographs: Cover, Gulton Industries, Inc., p. 115, Aerojet-General Corporation; p. 117, CBS Laboratories; p. 119, Boeing Airplane Company; p. 122, Society of Actuaries; p. 128, Utility House.

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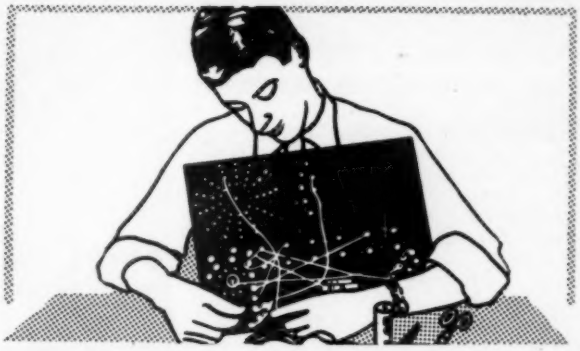

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Science News Letter, February 20, 1960

LAWN EDGER cuts grass along sidewalk edges neatly and rapidly. Operable with no digging, stooping or hand trimming, the edger has tubular steel handles, plastic grips, semi-pneumatic tires, cast iron gears, frictionless bearings and self-whetting blades of tool steel.

Science News Letter, February 20, 1960

CAMERA-TO-BINOCULAR HOLDER attaches easily to both camera and binoculars for taking low-cost, long-distance photographs. The 10-inch holder is finished in gray crinkle and bright chrome and can be mounted on a tripod. Rubber guards attach the binocular eyepiece to the camera and avoid extraneous light.

Science News Letter, February 20, 1960

POCKET SAW, shown in the photograph, easily cuts through lumber, tree branches, and plastic, yet can be rolled up and carried in a pocket. It consists of a thin

wire of durable cutting teeth made of steel. A finger ring is attached to each end for pulling the saw back and forth over the material to be cut.

Science News Letter, February 20, 1960

BODY THERMOMETER has a 1¼-inch watch-like dial for easy reading. A temperature-sensitive combination of metals encased in stainless steel substitutes for conventional mercury and glass. The thermometer is shock-proof, waterproof, and may be sterilized in the usual fashion with alcohol or disinfectant. It may be used either orally or rectally.

Science News Letter, February 20, 1960

ICE CUBE RETAINER of insulating plastic is strong enough to withstand more than 200 pounds of pressure, stays dry, and is easily washed. Light in weight and unscratchable, it holds four quarts of cubes.

Science News Letter, February 20, 1960

DRY CHEMICAL EXTINGUISHER, approved by Underwriters' Laboratories and the U.S. Coast Guard, has a protected pressure gauge that tells at a glance the unit's readiness for action. The 2½-pound extinguisher is claimed to have the fire-killing punch of eight one-quart carbon tetrachloride extinguishers.

Science News Letter, February 20, 1960

BEAKERS; WEIGHING BOTTLES, FUNNELS of rigid polypropylene withstand temperatures up to 280 degrees Fahrenheit and have high resistance to chemicals and stress cracking. Intended for laboratory use, the beakers come in two sizes with no-drip spouts, the bottles are water- and air-tight, and the funnels have 60-degree sides for quick filtration.

Science News Letter, February 20, 1960

Nature Ramblings

By HORACE LOFTIN

THE ANIMALS of the world fall within one of two major groups: those with backbones and those without. Probably the best example of a "spineless" animal is the jellyfish, whose body is made up of about 99% water! Typical of the backboned animals is man himself, with his strong internal skeleton, including a bony spinal column.

It should not be thought, however, that skeletons are limited to animals with backbones. Indeed, skeletons of one sort or another are found in nearly every class of creature in the animal kingdom. By definition, a skeleton is any hard, firm framework produced by an animal which gives support and protection to the body. It may also provide surfaces for attachment of muscles, as with the insects and backboned animals. Thus, the shell of a snail or the hard carapace of a crab is as much a skeleton as a man's bony framework.

Skeletons may be of two kinds, depending on where they are found: external skeletons which cover the body, as the snail shell; and internal skeletons, as the bones of man. Some animals may have both kinds, as for instance the turtle, with its typical vertebrate internal skeleton and hard external shell.

Down to Bare Bones

The one-celled animals, representing the most primitive form of animal life, have many representatives with skeletons. Best known of these are little amoeba-like creatures called foraminiferans which secrete limestone shells to cover their bodies.

Through countless ages, the shells of these one-celled animals have fallen to the ocean bottom to form thick deposits. The great pyramids of Egypt were made of limestone from foraminifera deposits.

Hard coral rock is the external skeleton of tiny coral animals. The various kinds of worms of the animal kingdom are generally devoid of any kind of skeleton. But many worms build up protective tubes and other coverings from body secretions or sand and shell debris which function as skeletons to some extent.

The typical mollusks such as clams and snails have a heavy shell as an external skeleton. The squids, which are highly modified mollusks, have a bone within their body which serves for support. This is the well-known "cuttle bone" used to supplement the diet of caged birds. Spiders, insects, crabs, shrimp and other crustaceans possess a well-formed hard external skeleton. This skeleton has soft areas, or "hinges," at the joints so that the animal may bend.

Science News Letter, February 20, 1960